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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
SU, BENJAMIN	
ART UNIT	PAPER NUMBER
2616	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/20/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/657,669	HWANG ET AL.	
	Examiner	Art Unit	
	Benjamin Su	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 September 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Korea on 09/07/2002. It is noted, however, that applicant has not filed a certified copy of the 54062/2002 application as required by 35 U.S.C. 119(b).

Specification

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Drawings

3. The drawings are objected to because in Figure 7A, the Box above Box S701 contains a non-English word. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary

to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

4. In addition to Replacement Sheets containing the corrected drawing figure(s), applicant is required to submit a marked-up copy of each Replacement Sheet including annotations indicating the changes made to the previous version. The marked-up copy must be clearly labeled as "Annotated Sheets" and must be presented in the amendment or remarks section that explains the change(s) to the drawings. See 37 CFR 1.121(d)(1). Failure to timely submit the proposed drawing and marked-up copy will result in the abandonment of the application.

Claim Rejections - 35 USC § 103

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1 – 3, 23 – 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Cai (CN1362803).

The admitted prior art disclose, regarding claim 1, a joint detection reception method comprising:

repeating individual channelization codes having variable lengths (see paragraph 81, lines 6 – 10);

performing a convolution operation between the channelization code blocks and a channel impulse response, and acquiring combined impulse responses (see Figure 3, Box 307 – 312. paragraph 81, lines 15 - 20);

grouping the combined impulse responses to construct sub-block matrices for a joint detection system (see paragraph 93, lines 6 - 11); and

arranging the sub-block matrices for the joint detection system to be shifted by a predetermined column distance, and constructing a joint detection system matrix (see paragraph 93, lines 12 - 16).

The admitted prior art fail to teach partitioning individual channelization codes having variable lengths and creating channelization code having same lengths.

Cai from the same or similar field of endeavors teach partitioning individual channelization codes having variable lengths and creating channelization code having same lengths (see Abstract, lines 3 – 6, wherein joint detection under the fixed frequency-spreading factor can be made implies channelization code having same lengths are used).

Thus, it would have been obvious to a person of ordinary skill in the art at the time of the invention to use partitioning individual channelization codes having variable lengths and creating channelization code having same lengths in the method taught by the admitted prior art in order to allow more efficient data estimation by reducing total system response matrix bandwidth.

The admitted prior art disclose, regarding claim 2, wherein the time slot comprises at least one area from a midamble area (see Figure 1, Box 110 Midamble);

regarding claim 3, extending the joint detection system matrix to a squared-format matrix to create block-circulant squared matrix (see paragraph 93, lines 6 – 11);

The admitted prior art, regarding claim 23, disclose, a channelization code generator for generating OVSFs (Orthogonal Variable Spreading factors) (see paragraph 21, lines 15);

a channel estimator for detecting midamble information from the received one time slot, and generating a channel impulse response using the detected midamble information (see paragraph 21, line 13);

and a joint detection unit for a) repeating and individual channelization codes having variable lengths (see paragraph 81, lines 6 – 10); b) performing a convolution operation between the repeated and partitioned channelization code blocks and a channel impulse response, and acquiring combined impulse responses (see Figure 3, Box 307 – 312. paragraph 81, lines 15 - 20); c) grouping the combined impulse responses to construct sub-block matrices for a joint detection system (see paragraph 93, lines 6 - 11); and d) arranging the sub-block matrices for the joint detection system to be shifted by a predetermined column distance, and constructing a joint detection system matrix (see paragraph 93, lines 12 - 16).

The admitted prior art fail to teach partitioning individual channelization codes having variable lengths and creating channelization code having same lengths.

Cai from the same or similar field of endeavors teach partitioning individual channelization codes having variable lengths and creating channelization code having same lengths (see Abstract, lines 3 – 6, wherein joint detection under the fixed frequency-spreading factor can be made implies channelization code having same lengths are used).

Thus, it would have been obvious to a person of ordinary skill in the art at the time of the invention to use partitioning individual channelization codes having variable lengths and creating channelization code having same lengths in the method taught by the admitted prior art in order to allow more efficient data estimation by reducing total system response matrix bandwidth.

The admitted prior disclose, regarding claim 24, wherein the time slot comprises at least one area from a midamble area (see Figure 1, Box 110 Midamble);

regarding claim 25, extending the joint detection system matrix to a squared-format matrix to create block-circulant squared matrix (see paragraph 93, lines 6 – 11);

9. Claims 4 – 5, 26 - 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art and Cai in view of Vollmer et al. (Non-Patent Literature/Comparative Study of Joint-Detection Techniques for TD-CDMA Based Mobile Radio Systems).

Regarding claims 4, 5, the admitted prior art and Cai teach all the subject matter of the claimed invention as recited in paragraph 8 of this office action.

The admitted prior art and Cai fail to teach adding a predetermined value to a lower end position of a received signal vector corresponding to the block circulant squared matrix in order to provide a predetermined length equal to that of a column of the block-circulant squared matrix as recited in claim 4.

Vollmer et al. from the same or similar field of endeavors teach adding a predetermined value to a lower end position of a received signal vector corresponding to the block circulant squared matrix in order to provide a predetermined length equal to that of a column of the block-circulant squared matrix (see section VI. BLOCK-FOURIER ALGORITHM, subsection B. Application to TD-CDMA, lines 10 – 12).

Thus, it would have been obvious to a person of ordinary skill in the art at the time of the invention to use adding a predetermined value to a lower end position of a received signal vector corresponding to the block circulant squared matrix in order to provide a predetermined length equal to that of a column of the block-circulant squared matrix in the method taught by the admitted prior art and Cai in order to allow efficient data estimation.

The admitted prior art and Cai fail to teach applying a block FFT/DFT (Fast Fourier Transform / Discrete Fourier Transform) algorithm to the block-circulant squared matrix to acquire a solution of the block-circulant squared matrix as recited in claim 5.

Vollmer et al. from the same or similar field of endeavors teach applying a block FFT/DFT (Fast Fourier Transform / Discrete Fourier Transform) algorithm to the block-circulant squared matrix to acquire a solution of the block-circulant squared matrix (see section IVBLOCK-FOURIER ALGORITHM, subsection D. Parallelism, lines 26 - 35).

Thus, it would have been obvious to a person of ordinary skill in the art at the time of the invention to use applying a block FFT/DFT (Fast Fourier Transform / Discrete Fourier Transform) algorithm to the block-circulant squared matrix to acquire a

solution of the block-circulant squared matrix in the method taught by the admitted prior art and Cai in order to allow easy data processing by lowering the computational requirements (see Vollmer et al. section VII SIMULATION RESULTS AND COMPUTATIONAL COMPLEXITY, lines 88 – 90)

Claims 26, 27 are rejected the same reason as above.

10. Claims 6, 7, 12, 13, 18, 20, 21, 22, 28, 29, 31, 32, 33, 34, 35, 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Cai and further in view of Vollmer.

The admitted prior art discloses, regarding claim 6, a joint detection reception method comprising:

performing repetition of all channelization codes created from different bursts until a length of individual channelization code blocks is equal to a predetermined value (see paragraph 81, lines 6 – 10);

performing a convolution operation between at least one partitioned sub-block and a radio channel impulse response, and creating combined impulse responses (see Figure 3, Box 307 – 312. paragraph 81, lines 15 – 20);

grouping the combined impulse responses into combined impulse response sub-block matrices, arranging the combined impulse response sub-block matrices each to be downshifted by an integer times a predetermined offset value, and constructing joint detection sub-block matrices (see paragraph 93, lines 6 -16); and

arranging individual joint detection sub-block matrices to be downshifted by an

integer times the maximum spreading factor, and constructing a joint detection system matrix (see paragraph 93, lines 12 – 16).

the admitted prior art fails to teach creating channelization code blocks having the same lengths.

Cai from the same or similar field of endeavors teach creating channelization code blocks having the same lengths (see Abstract, lines 3 – 6, wherein joint detection under the fixed frequency-spreading factor can be made implies channelization code having same lengths are used).

Thus, it would have been obvious to a person of ordinary skill in the art at the time of the invention to use creating channelization code having same lengths in the method taught by the admitted prior art in order to allow more efficient data estimation by reducing total system response matrix bandwidth.

The admitted prior art and Cai fail to teach partitioning the channelization code blocks having same lengths into at least one sub-block in order to create channelization code blocks constructed in terms of minimum spreading factors of individual spreading factor sets.

Vollmer et al. from the same or similar field of endeavors teach partitioning the channelization code blocks having same lengths into at least one sub-block in order to create channelization code blocks constructed in terms of a predetermined length (see section B Application to TD-CDMA, subsection C overlapping, lines 6 – 10).

Thus, it would have been obvious to a person of ordinary skill in the art at the time of the invention to use partitioning the channelization code blocks having same lengths into at least one sub-block in order to create channelization code blocks constructed in terms of a predetermined length in the method taught by the admitted prior art and Cai in order to allow fast processing by reducing computational demands.

The admitted prior art, Cai and Vollmer fail to teach partitioning the channelization code blocks having same lengths into at least one sub-block in order to create channelization code blocks constructed in terms of minimum spreading factors of individual spreading factor sets.

However, it is obvious to partitioning the channelization code blocks having same lengths into at least one sub-block in order to create channelization code blocks constructed in terms of minimum spreading factors of individual spreading factor sets.

Thus, it would have been obvious to a person of ordinary skill in the art at the time of the invention to use partitioning the channelization code blocks having same lengths into at least one sub-block in order to create channelization code blocks constructed in terms of minimum spreading factors of individual spreading factor sets in the method taught by the admitted prior art, Cai and Vollmer et al. in order to allow fast data processing by reducing computational demands.

The admitted prior art discloses, regarding claim 7, wherein the time slot comprises at least one area selected from a midamble area (see Figure 1, Box 110 Midamble).

Claims 12, 13 are rejected the same reason as above.

The admitted prior art discloses, regarding claim 18, grouping the combined impulse responses into a sub-block matrix, arranging a number of grouped impulse responses to be downshifted by an integer times a predetermined offset value in ascending numerical order of a specific variable, and constructing a sub-block matrix of a joint detection system matrix; and k) arranging the sub-block matrices to be downshifted by an integer times a predetermined factor, and constructing a joint detection system matrix (see paragraph 93, lines 6 –16).

Vollmer et al. discloses, regarding claim 20, adding a predetermined value to a lower end position of a received signal vector coreesponding to the matrix in order to provide a predetermined length equal to that of a column of the block-circulant squared matrix (see section VI. BLOCK-FOURIER ALGORITHM, subsection B. Application to TD-CDMA, lines 10 – 12);

Vollmer et al. discloses, regarding claim 21, applying a block FFT/DFT (Fast Fourier Transform / Discrete Fourier Transform) algorithm to the block-circulant squared matrix to acquire a solution of the block-circulant squared matrix (see section IVBLOCK-FOURIER ALGORITHM, subsection D. Parallelism, lines 26 - 35).

The admitted prior art, Cai and Vollmer et al. fail to teach creating an estimated data vector associated with a joint detection element having different spreading factors by performing repetition of predetermined estimated data as recited in claim 22.

However, it is well-known in the art to create a data vector by repeating the data.

Thus, it would have been obvious to a person of ordinary skill in the art at the time of the invention to use creating an estimated data vector associated with a joint detection element having different spreading factors by performing repetition of predetermined estimated data in the method taught by the admitted prior art, Cai and Vollmer et al. in order to allow fast data processing.

Claims 31 – 33 are rejected the same reason as above.

The admitted prior discloses, regarding claim 28, a channelization code generator for generating OVSFs (Orthogonal Variable Spreading factors) (see paragraph 21, lines 15);

a channel estimator for detecting midamble information from the received one time slot, and generating a channel impulse response using the detected midamble information (see paragraph 21, line 13);

performing repetition of all channelization codes created from different bursts until a length of individual channelization code blocks is equal to a predetermined value (see paragraph 81, lines 6 – 10); c) performing a convolution operation between at least one

partitioned sub-block and a radio channel impulse response, and creating combined impulse responses (see Figure 3, Box 307 – 312. paragraph 81, lines 15 – 20); d) grouping the combined impulse responses into combined impulse response sub-block matrices, arranging the combined impulse response sub-block matrices each to be downshifted by an integer times a predetermined offset value, and constructing joint detection sub-block matrices (see paragraph 93, lines 12 – 16); e) arranging the M sub-block matrices to be downshifted by an integer times a predetermined offset value, and constructing a sub-block matrix of a joint detection system matrix (see paragraph 93, lines 12 – 16); and f) arranging the sub-block matrices to be downshifted by an integer times a predetermined value, and constructing a joint detection system matrix (see paragraph 93, lines 12 – 16).

the admitted prior art fails to teach creating channelization code blocks having the same lengths.

Cai from the same or similar field of endeavors teach creating channelization code blocks having the same lengths (see Abstract, lines 3 – 6, wherein joint detection under the fixed frequency-spreading factor can be made implies channelization code having same lengths are used).

Thus, it would have been obvious to a person of ordinary skill in the art at the time of the invention to use creating channelization code having same lengths in the method taught by the admitted prior art in order to allow more efficient data estimation by reducing total system response matrix bandwidth.

The admitted prior art and Cai fail to teach partitioning the channelization code blocks having same lengths into at least one sub-block in order to create channelization code blocks constructed in terms of minimum spreading factors of individual spreading factor sets.

Vollmer et al. from the same or similar field of endeavors teach partitioning the channelization code blocks having same lengths into at least one sub-block in order to create channelization code blocks constructed in terms of a predetermined length (see section B Application to TD-CDMA, subsection C overlapping, lines 6 – 10).

Thus, it would have been obvious to a person of ordinary skill in the art at the time of the invention to use partitioning the channelization code blocks having same lengths into at least one sub-block in order to create channelization code blocks constructed in terms of a predetermined length in the method taught by the admitted prior art and Cai in order to allow fast processing by reducing computational demands.

The admitted prior art, Cai and Vollmer fail to teach partitioning the channelization code blocks having same lengths into at least one sub-block in order to create channelization code blocks constructed in terms of minimum spreading factors of individual spreading factor sets.

However, it is obvious to partitioning the channelization code blocks having same lengths into at least one sub-block in order to create channelization code blocks constructed in terms of minimum spreading factors of individual spreading factor sets.

Thus, it would have been obvious to a person of ordinary skill in the art at the time of the invention to use partitioning the channelization code blocks having same lengths into at least one sub-block in order to create channelization code blocks constructed in terms of minimum spreading factors of individual spreading factor sets in the method taught by the admitted prior art, Cai and Vollmer et al. in order to allow fast data processing by reducing computational demands.

The admitted prior art discloses, regarding claim 29, wherein the time slot comprises at least one area selected from a midamble area (see Figure 1, Box 110 Midamble).

Claims 34, 35 are rejected the same reason as above.

The admitted prior art discloses, regarding claim 40, the joint detection unit, after creating combined impulse responses, groups the combined impulse responses into one sub-block matrix, arranges a number of grouped impulse responses to be downshifted by an integer times a predetermined offset value in ascending numerical order of a specific variable, and constructing a sub-block matrix of a joint detection system matrix; and arranges the sub-block matrices to be downshifted by an integer times a predetermined factor, and constructs a joint detection system matrix (see paragraph 93, lines 6 – 16).

11. Claims 8 – 11, 14 – 17, 19, 30, 36, 37, 38, 39, 41, 42, 43, 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art and Cai and Vollmer et al. in view of Kim et al. (US 2004/0001528).

The admitted prior art, Cai and Vollmer et al. disclose all the subject matter of the Claimed invention as recited in paragraph 10 of this office action.

The admitted prior art, Cai and Vollmer et al. fail to teach performing addition of sub-block columns of the system matrix until the joint detection system matrix is converted into a one block-circulant squared matrix as recited in claim 8.

Kim et al. from the same or similar field of endeavors teach performing addition of sub-block columns of the system matrix until the joint detection system matrix is converted into a one block-circulant squared matrix (see paragraph 32, lines 10);

Thus, it would have been obvious to a person of ordinary skill in the art at the time of the invention to use performing addition of sub-block columns of the system matrix until the joint detection system matrix is converted into a one block-circulant squared matrix in the method taught by the admitted prior art, Cai and Vollmer et al. in order to allow fast data processing.

Claims 14, 19, 30, 36, 41 are rejected the same reason as above.

Vollmer et al. disclose, regarding claim 9, adding a predetermined value to a lower end position of a received signal vector corresponding to the block-circulant squared matrix in order to provide a predetermined length equal to that of a column of the block-circulant squared matrix (see section VI. BLOCK-FOURIER ALGORITHM,

subsection B. Application to TD-CDMA, lines 10 – 12).

Vollmer et al. disclose, regarding claim 10, applying a block FFT/DFT (Fast Fourier Transform / Discrete Fourier Transform) algorithm to the block-circulant squared matrix to acquire a solution of the block-circulant squared matrix (see section IVBLOCK-FOURIER ALGORITHM, subsection D. Parallelism, lines 26 - 35).

Claims 15, 16, 37, 38, 42, 43 are rejected the same reason as above.

The admitted prior art, Cai and Vollmer et al. fail to teach creating an estimated data vector associated with a joint detection element having different spreading factors by performing repetition of predetermined estimated data as recited in claim 11.

However, it is well-known in the art to create a data vector by repeating the data.

Thus, it would have been obvious to a person of ordinary skill in the art at the time of the invention to use creating an estimated data vector associated with a joint detection element having different spreading factors by performing repetition of predetermined estimated data in the method taught by the admitted prior art, Cai and Vollmer et al. in order to allow fast data processing.

Claims 17, 22, 33, 44 are rejected the same reason as above.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Zeira (US 7003019) and Johnson (US 2003/0128742) are cited to show methods which are considered pertinent to the claimed invention.Any inquiry concerning this communication or earlier communications from the examiner should be directed to Benjamin Su whose telephone number is 571-270-1423. The examiner can normally be reached on Monday - Friday 10 - 3 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Q. Ngo can be reached on 571-272-3139. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BZS

Benjamin Su

RICKY Q. NGO
SUPERVISORY PATENT EXAMINER